Listing of Claims

Please replace all prior versions of claims with the following listing of claims:

1. ***(Currently Amended)*** A lithographic projection apparatus comprising:

a projection system configured to project a patterned beam of radiation onto a target portion of a substrate;

an alignment system;

a control system configured to generate a ~~control signal according to a~~ predicted change in a time-varying property of a part of said apparatus; ~~and~~

a comparator configured to compare a value, based on the predicted change, to a threshold and to generate a trigger signal when the value is greater than the threshold~~,~~; and

a threshold adjustor that is configured to adjust the threshold,

wherein said alignment system is configured to perform an alignment task in response to the trigger signal~~, and~~

~~wherein the threshold is adjustable~~.

2. ***(Original)*** The lithographic projection apparatus according to claim 1, wherein the alignment task includes obtaining a measurement of the time-varying property.

3. ***(Currently Amended)*** The lithographic projection apparatus according to claim 1, wherein the control system is configured to adjust the threshold according to a relation between a measurement of the time-varying property and ~~a~~the value, based on the predicted change.

4. ***(Currently Amended)*** The lithographic projection apparatus according to claim 3, wherein the threshold is reduced in response to a determination that a distance between ~~a~~the measurement of the time-varying property and ~~a~~the value based on the predicted change is greater than a second threshold.

5. ***(Currently Amended)*** The lithographic projection apparatus according to claim 3, wherein the threshold is increased in response to a determination that a distance between

~~a~~the measurement of the time-varying property and a value, based on the predicted change, is less than a second threshold.

6. ***(Original)*** The lithographic projection apparatus according to claim 3, wherein the control system is configured to increase the threshold by an increment, and wherein the increment is adjustable.

7. ***(Currently Amended)*** The lithographic projection apparatus according to claim 6, wherein the increment is reduced in response to a determination that a distance between ~~a~~the measurement of the time-varying property and ~~a~~the value, based on the predicted change, is greater than a second threshold.

8. ***(Currently Amended)*** The lithographic projection apparatus according to claim 6, wherein the increment is increased in response to a determination that a distance between ~~a~~the measurement of the time-varying property and ~~a~~the value, based on the predicted change, is less than a second threshold.

9. ***(Currently Amended)*** The lithographic projection apparatus according to claim 1, wherein, in response to the ~~control signal~~predicted change in the time-varying property, the apparatus is configured to compensate for a change in the time-varying property.

10. ***(Currently Amended)*** The lithographic projection apparatus according to claim 1, wherein, in response to the ~~control signal~~predicted change in the time-varying property, the apparatus is configured to adjust a position of ~~at least one among~~(1) a mask having the pattern of the patterned beam, (2) the substrate, ~~and~~ (3) an element of said projection system, or (4) any combination of (1) to (3).

11. ***(Currently Amended)*** The lithographic projection apparatus according to claim 1, wherein, in response to the ~~control signal~~predicted change in the time-varying property, the apparatus is configured to compensate for a change in the time-varying property relative to a most recent measurement of the time-varying property.

12. ***(Currently Amended)*** The lithographic projection apparatus according to claim 1, wherein, in response to the ~~control signal~~predicted change in the time-varying property, the apparatus is configured to compensate for a change in the time-varying property relative to a most recent performance of ~~an~~the alignment task.

13. ***(Original)*** The lithographic projection apparatus according to claim 1, wherein the time-varying property includes a temperature-dependent property of said projection system.

14. ***(Original)*** The lithographic projection apparatus according to claim 13, wherein the temperature-dependent property includes an optical property.

15. ***(Original)*** The lithographic projection apparatus according to claim 14, wherein the optical property includes a magnification.

16. ***(Original)*** The lithographic projection apparatus according to claim 1, wherein said alignment system is adapted to perform a first alignment task and a second alignment task that provides a larger number of measurements than the first alignment task, and

wherein said alignment system is adapted to perform the second alignment task in response to the trigger signal.

17. ***(Currently Amended)*** A lithographic projection apparatus comprising:

a projection system configured to project a patterned beam of radiation onto a target portion of a substrate;

an alignment system;

a control system configured to generate a ~~control signal according to a~~ predicted change in a time-varying property of a part of said apparatus; ~~and~~

a comparator configured to compare a value, based on the predicted change, to a threshold and to generate a trigger signal when the value is greater than the threshold~~;~~; and

an adjustor that is configured to determine a modified predicted change in the time-varying property, based on a measurement of the time-varying property,

wherein the alignment system is configured to perform an alignment task in response to the trigger signal~~, and~~

~~wherein the control system is configured to determine a modified predicted change in the time-varying property based on a measurement of the time-varying property~~.

18. ***(Currently Amended)*** The lithographic projection apparatus according to claim 17, wherein the control system is configured to store a modified value, based on the modified predicted change, and

wherein the apparatus is configured to perform an operation on a second substrate according to the modified value ~~based on the modified predicted change~~.

19. ***(Currently Amended)*** The lithographic projection apparatus according to claim 17, wherein the ~~control system~~adjustor is configured to determine a plurality of modified predicted changes in the time-varying property and to store a plurality of modified values~~, each~~ based on a corresponding one of the modified predicted changes, and

wherein the apparatus is configured to perform an operation on a second substrate according to a selected one among the plurality of modified values.

20. ***(Currently Amended)*** The lithographic projection apparatus according to claim 17, wherein, in response to the ~~control signal~~predicted change in the time-varying property, the apparatus is configured to compensate for a change in the time-varying property.

21. ***(Currently Amended)*** The lithographic projection apparatus according to claim 17, wherein, in response to the ~~control signal~~predicted change in the time-varying property, the apparatus is configured to compensate for a change in the time-varying property relative to a most recent measurement of the time-varying property.

22. ***(Original)*** The lithographic projection apparatus according to claim 17, wherein said time-varying property includes a temperature-dependent property of said projection system.

23. ***(Original)*** The lithographic projection apparatus according to claim 22, wherein the temperature-dependent property includes an optical property.

24. ***(Original)*** The lithographic projection apparatus according to claim 23, wherein the optical property includes a magnification.

25. ***(Original)*** The lithographic projection apparatus according to claim 17, wherein said alignment system is adapted to perform a first alignment task and a second alignment task that provides a larger number of measurements than said first alignment task, and

wherein said alignment system is adapted to perform said second alignment task in response to said trigger signal.

26. ***(Currently Amended)*** A device manufacturing method using a lithographic projection apparatus, the method comprising:

providing a substrate that is at least partially covered by a layer of radiation-sensitive material;

using a projection system to project a patterned beam of radiation onto a target portion of the layer of radiation-sensitive material;

generating~~based on~~ a predicted change of a time-varying property of a part of said apparatus at ~~the~~a time of a particular exposure~~, generating a control signal~~;

obtaining a threshold value~~applying the control signal to adjust an aspect of the apparatus~~;

detecting when a value based on the predicted change exceeds ~~an~~the ~~adjustable~~ threshold value; ~~and~~

enabling adjustment of the threshold value; and

~~in response to said detecting,~~ performing an alignment task in response to said detecting.

27. ***(Original)*** The device manufacturing method according to claim 26, wherein the alignment task includes obtaining a measurement of the time-varying property.

28. ***(Currently Amended)*** The device manufacturing method according to claim 26, ~~said method~~ further comprising adjusting the threshold value according to a relation between a measurement of the time-varying property and ~~a~~the value based on the predicted change.

29. ***(Currently Amended)*** The device manufacturing method according to claim 28, ~~said method~~ further comprising reducing the threshold value in response to a determination that a distance between a measurement of the time-varying property and ~~a~~the value based on the predicted change is greater than a second threshold.

30. ***(Currently Amended)*** The device manufacturing method according to claim 28, ~~said method~~ further comprising increasing the threshold value in response to a determination that a distance between a measurement of the time-varying property and ~~a~~the value based on the predicted change is less than a second threshold.

31. ***(Currently Amended)*** The device manufacturing method according to claim 28, ~~said method~~ further comprising increasing the threshold value by an increment, and wherein the increment is adjustable.

32. ***(Currently Amended)*** The device manufacturing method according to claim 31, ~~said method~~ further comprising reducing the increment in response to a determination that a distance between a measurement of the time-varying property and ~~a~~the value based on the predicted change is greater than a second threshold.

33. ***(Currently Amended)*** The device manufacturing method according to claim 31, ~~said method~~ further comprising increasing the increment in response to a determination that a distance between a measurement of the time-varying property and ~~a~~the value based on the predicted change is less than a second threshold.

34. ***(Currently Amended)*** The device manufacturing method according to claim 26, ~~said method~~ further comprising, ~~in response to the control signal, compensating~~ performing the alignment task to compensate for ~~a~~the change in the time-varying property relative to a most recent measurement of the time-varying property.

35. ***(Original)*** The device manufacturing method according to claim 26, wherein said time-varying property includes a temperature-dependent property of the projection system.

36. ***(Original)*** The device manufacturing method according to claim 35, wherein the temperature-dependent property is a magnification.

37. ***(Currently Amended)*** A device manufacturing method using a lithographic projection apparatus, the method comprising:

providing a substrate that is at least partially covered by a layer of radiation-sensitive material;

using a projection system to project a patterned beam of radiation onto a target portion of the layer of radiation-sensitive material;

generating~~based on~~ a predicted change of a time-varying property of a part of said apparatus at ~~the~~a time of a particular exposure~~, generating a control signal~~;

~~applying the control signal to~~ adjusting an aspect of the apparatus based on the predicted change of the time-varying property;

obtaining a threshold value;

detecting when a value based on the predicted change exceeds ~~an adjustable~~the threshold value;

~~in response to said detecting,~~ performing an alignment task in response to said detecting; and

determining a modified predicted change in the time-varying property based on a measurement of the time-varying property.

38. ***(Currently Amended)*** The device manufacturing method according to claim 37, ~~said method~~ further comprising~~, in response to the control signal,~~ compensating for a change in the time-varying property relative to a most recent measurement of the time-varying property.

39. ***(Original)*** The device manufacturing method according to claim 37, wherein said time-varying property includes a temperature-dependent property of the projection system.

40. ***(Original)*** The device manufacturing method according to claim 39, wherein the temperature-dependent property is a magnification.